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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/720,554	12/27/2000	Ayako Hohsaka	HOHSAKA-2	2522

7590

03/07/2002

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EXAMINER

ANGEBRANNDT, MARTIN J

ART UNIT

PAPER NUMBER

1756

6

DATE MAILED: 03/07/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

T.D-6

# Office Action Summary

Application No.

09/720,554

Applicant(s)

HOHSAKA ET AL.

Examiner

Martin J Angebranndt

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 10 December 2001 and 27 December 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-11 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-11 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 3.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

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1. Claims 1-11 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 1, there is no 15 group in the periodic table. The applicant may want to merely specify the anions themselves. Please note that the ions of metallic elements by themselves would be cations, not anions. ( $\text{As}^{+5}$  is positively charged, but  $\text{AsF}_6^-$  is negatively charged) The applicant may want to provide a copy of the periodic table used to establish the basis for members of group 15 and change the nomenclature to be group 5a (IUPAC).

Claims 5,7,8,10 and 11 should not refer back to claims in another statutory class.

In claims 10 and 11, at least one of the anions ( $\text{X}_1^-$  or  $\text{X}_2^-$ ) would have to be that of the resultant dye ( $\text{X}^-$ ).

2. Claim 3 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form.

All pentamethine dyes all absorb at his wavelength.

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sato et al.

'839.

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Sato et al. '839 teaches the use of compounds embraced by formula (I), where the benzene nuclei may be condensed with one or more benzene rings or may be substituted by various moieties. (3/18-24) the number of methine groups is 5 when n is 2 (2/64). The anions may be any acid anions including halogens, and  $\text{SbF}_6^-$ . (2/65-67). The N-alkyl groups are different with  $\text{R}_5$  being a  $\text{C}_{1-3}$  alkyl group and  $\text{R}_6$  being a  $\text{C}_{3-18}$  alkyl group. This asymmetry is disclosed as improving the stability, solubility and the like. (4/20-30 and 2/10-15).

It would have been obvious to modify compounds 6 or 16 by using benzoindole moieties such as those shown in compounds 5 and 10 as the terminal moieties with a reasonable expectation of forming a dye useful in optical recording with similar spectral, solubility and stability to that of compounds 6 or 16. It also would have been obvious to use other anions disclosed, such as halogens and  $\text{AsF}_6^-$ , in place of the  $\text{BF}_4^-$  with a reasonable expectation of achieving comparable results based upon the disclosure of these as preferred anion species. Further it would have been obvious to one skilled in the art to use the resultant dyes in optical recording media based upon the disclosure to do so within the reference.

5. Claims 1-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over either Inagaki et al. '281 or Maeda et al. EP 0483387 or Morishima et al. '772, in view of Sato et al. '839.

Inagaki et al. '281 teach the use of compounds embraced by the formula (1), which includes linking groups such as those of formula (b) in column 3. The substituents Y may be hydrogen, alkyl groups, and halogens. (4/21-32). Benzoindoleneic terminal moieties are taught as evidenced by compounds 14 and 15 in columns 7 and 8. The use of the  $\text{PF}_6^-$  anion is disclosed as resulting in increased stability, has good solubility and is free from the danger of explosion. (1/65-2/4). The dyes disclosed are all symmetric.

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Maeda et al. EP 0483387 teaches the use of cyanine dyes embraced by the formula (II) on page 15, where the linking group is a pentamethine linkage. The dyes in example 7 is a symmetric pentamethine benzoindolenic dye having a  $\text{PF}_6^-$  anion as the counterion.

Morishima et al. '772 teaches the use of cyanine dyes embraced by the formula (B-1) in column 26, where the linking group is a pentamethine linkage optionally substituted with alkyl or halogen moieties and the Z moieties may be naphthalene residues and the N-substituents may be the same or different. (26/11-21). The dyes B-3, B-14 and B-10, in example 7 is a symmetric pentamethine benzoindolenic dye having a  $\text{PF}_6^-$  anion as the counterion. The use of fluorine as the anion is also disclosed. (24/66).

It would have been obvious to one skilled in the art to modify the symmetric pentamethine benzoindolenic dye having a  $\text{PF}_6^-$  anion as the counterion embraced within the teachings of either Inagaki et al. '281 or Maeda et al. EP 0483387 or Morishima et al. '772 by using different N-substituents on the benzoindolenic moieties based upon the teachings of Sato et al. '839 with a reasonable expectation of achieving the increases in solubility, stability and the like as this is attributed to the asymmetry in the N-substituents.

6. Claims 1-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yashiro et al. JP 05-147356, in view of Inagaki et al. '281 and/or Saito et al. '089.

Yashiro et al. JP 05-147356 teaches asymmetric pentamethine dyes with perchlorate counterions.

Saito et al. '089 teaches that the use of the  $\text{PF}_6^-$  anion as the counterion increases the thermal decomposition temperature of the cyanine dye relative to the perchlorate ion. (table 3,

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Col. 22). This translates to increased resistance to fading of the dye due to heat or light, increased writing sensitivity and high C/N values.

It would have been obvious to modify the teachings of Yashiro et al. JP 05-147356 by using the  $\text{PF}_6^-$  anion as the counterion as taught by Inagaki et al. '281 and/or Saito et al. '089 with a reasonable expectation of improving the stability of the resultant medium with respect to heat and light based upon the teachings of Inagaki et al. '281 and/or Saito et al. '089.

7. Claims 1-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sato et al. '839 further in view of either Borrer et al. '971, Mee et al '419, Lee et al. '868, GB 355693 and Hamer, F.M., "The Cyanine Dyes and Related Compounds" (1964) pp. 200-243.

Borrer et al. '971 teaches the formation of unsymmetrical cyanine dyes through a reaction of the p-toluenesulfoanilinovinyl derivative of E with a heterocyclic compound having a reactive methyl group. (5/15-6/26).

Mee et al '419 teaches the reaction of the product of example 3 with 3-ethyl-2-methyl-6-nitrobenzothiazolinium in example 7.

Lee et al. '868 teaches the reaction of compound 3 with compound 4 containing an active methyl group in pyridine, followed by acid to produce the compound 5 shown in figure 3c.

GB 355693 teaches the production of unsymmetrical cyanine dyes using a heterocyclic molecule containing a methylene linkage with an aryl amino leaving group with a heterocyclic ammonium salt containing a reactive methyl group. (1/88-2/6)

Hamer, F.M., "The Cyanine Dyes and Related Compounds" (1964) pp. 200-243 teaches various methods for making unsymmetrical cyanine dyes including that describing the reaction

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of compound (II) on page 201 with quaternary salts of heterocyclic moieties having a reactive methyl group. (201-202).

It would have been obvious to one skilled in the art to use **old and well known** synthesis processes, such as those disclosed by either Borrer et al. '971, Mee et al '419, Lee et al. '868, GB 355693 and Hamer, F.M., "The Cyanine Dyes and Related Compounds" (1964) pp. 200-243 as useful for forming cyanine dyes to form the cyanine dyes of Sato et al. '839 with a reasonable expectation of forming the desired compounds based upon the age and repeated testing of this synthetic process as evidenced by the number of references.

8. Claims 1-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over either Inagaki et al. '281 or Maeda et al. EP 0483387 or Morishima et al. '772 as modified by Sato et al. '839 and further in view of either Borrer et al. '971, Mee et al '419, Lee et al. '868, GB 355693 and Hamer, F.M., "The Cyanine Dyes and Related Compounds" (1964) pp. 200-243.

It would have been obvious to one skilled in the art to use **old and well known** synthesis processes, such as those disclosed by either Borrer et al. '971, Mee et al '419, Lee et al. '868, GB 355693 and Hamer, F.M., "The Cyanine Dyes and Related Compounds" (1964) pp. 200-243 as useful for forming cyanine dyes to form the cyanine dyes of over either Inagaki et al. '281 or Maeda et al. EP 0483387 or Morishima et al. '772 as modified by Sato et al. '839 with a reasonable expectation of forming the desired compounds based upon the age and repeated testing of this synthetic process as evidenced by the number of references.

9. Claims 1-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yashiro et al. JP 05-147356 as modified by Inagaki et al. '281 and/or Saito et al. '089 further in view of either

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Borrer et al. '971, Mee et al '419, Lee et al. '868, GB 355693 and Hamer, F.M., "The Cyanine Dyes and Related Compounds" (1964) pp. 200-243.

It would have been obvious to one skilled in the art to use **old and well known** synthesis processes, such as those disclosed by either Borrer et al. '971, Mee et al '419, Lee et al. '868, GB 355693 and Hamer, F.M., "The Cyanine Dyes and Related Compounds" (1964) pp. 200-243 as useful for forming cyanine dyes to form the cyanine dyes of Yashiro et al. JP 05-147356 as modified by Inagaki et al. '281 and/or Saito et al. '089 with a reasonable expectation of forming the desired compounds based upon the age and repeated testing of this synthetic process as evidenced by the number of references.

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Chapman et al. '015 disclose unsymmetrical dyes similar to those claimed in table 2.

Namba et al. '314 teach various cyanine dyes.

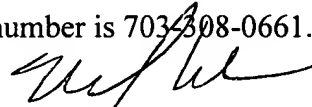
11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Martin J Angebrannt whose telephone number is 703-308-4397. The examiner can normally be reached on Mondays-Thursday and alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Huff can be reached on 703-308-2464. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9310 for regular communications and 703-872-9311 for After Final communications.



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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.



Martin J Angebranndt  
Primary Examiner  
Art Unit 1756

March 4, 2002